Specifications for Jet Vac Combo Truck; 9 cu. Yds.

Acceptable brands/models: Vactor 2100i, Camel Max Series 900 or equal

SPECIAL INSTRUCTIONS

All bidders are expected to quote upon a manufacturer's latest standard conventional model truck complete with all standard equipment plus any optional or special equipment required meeting these specifications.

NOTE: Unit(s) shall meet the US EPA emissions standards

DELIVERY REQUIREMENTS

Delivery does not mean acceptance. As each unit is delivered it will be inspected and must be 100% operational before payment is processed. If any unit is not 100% operational, the successful bidder must make necessary adjustments or repairs before the unit(s) will be acceptable. TDOT regional garage manager at each delivery location shall be responsible for final inspection/approval.

DOCUMENTS

Owner's manual, warranty papers, extra key, invoice and manufacturer's statement of origin are to be furnished with each unit. The manufacturer's statement of origin shall be executed in the name of:

Tennessee Department of Transportation
505 Deaderick Street
Nashville, TN. 37243-0346

Operations, parts and service manuals for all equipment along with wiring diagrams for additional equipment shall be provided upon delivery of the unit(s).

Chassis

Chassis:

The unit shall be a new, unused 2021 Conventional Chassis 43,000# GVWR with a 234" – 255" wheelbase and an approximate length of 167"-188" cab to axle, white in color. The entire unit should not exceed 11' 6" in overall height. Bidder to state make model and year of the unit.

Frame:

Frame shall be a 120,000 PSI, heavy duty steel frame with ¼" full outer C-channel reinforcement and integral 20" front frame extension and approximately 38" rear frame overhang (SPECIAL NOTE: JET VAC COMBO MANUFACTURE SHALL PROVIDE MEASUREMENT NEEDS TO TRUCK SUPPLIER) Two (2) Front Tow Hooks shall be included. Front bumper shall be full width and comprised of heavy duty ¼" steel.

Engine:

Engine shall be a Cummins ISL9 9L, 370 HP @ 2000 RPM, 1250 lb./ft of torque @ 1400 RPM. It shall include an RH Horizontal aftertreatment device (SPECIAL NOTE: JET VAC COMBO MANUFACTURE SHALL PROVIDE MOUNTING INSTRUCTIONS TO TRUCK SUPPLIER), frame-mounted under cab, with a vertical tailpipe. A stainless-steel muffler/exhaust guard shall be included. It shall have an 18.7 CFM air compressor and a 160-amp alternator. It shall have a Cummins engine exhaust brake, 1000W/120V engine block heater with plug under driver's door, Heated Fuel/Water Separator, and an engine warning and protection system.

Transmission:

Transmission shall be an Allison 3000 RDS Automatic 6-Speed with PTO provisions and stalk mounted controls. Transmission shall have forced neutral to shift chassis into neutral when service brakes are applied, and vehicle is stopped. Transmission shall resume normal position when service brake is released.

Axles:

FRONT AXLE & SUSPENSION:

Front axle and suspension shall be 20,000# capacity with shock absorbers and power steering. The unit shall be equipped with a 20,000# Flat Leaf Front Suspension.

REAR AXLE & SUSPENSION:

Rear axle shall be 26,000# single reduction with heavy a duty steel housing. Rear suspension shall be 30,000# (minimum). It shall have a top governed speed between 65-70 mph.

Brakes:

Brakes shall be full ABS air brakes, 16.5" x 7" rear, 16.5" x 6" front. Front and rear brake dust shields and oil seals shall be included. Heated, Wabco air dryer. Shall include automatic slack adjusters, front and rear.

Tires:

425/65R22.5 L (24PR) Radial Front Tires.
11.00R22.5 H (16PR) HDR2 Radial Dual Rear Tires.

Wheels:
22.5 X 12.25 Hub Piloted Front Wheels. (COLOR WHITE)
22.5 X 8.25 Hub Piloted Rear Wheels. (COLOR WHITE)

Cab:

Cab shall be a minimum 114" BBC steel air mounted conventional cab. It shall have a tilt fiberglass hood with front rubber fender extensions, front mud flaps and stationary grille. Daytime running lights and low beams shall come standard. It shall be equipped with a manual toggle switch for work lights. Cab interior environment shall have a fully integral air conditioner with heater and defroster. Additional features shall include; intermittent windshield wipers and washers, roof mounted air horn with electric horn, LH & RH cab exterior entry assist handles, high back air ride driver's air ride seat with high back air ride passenger seat., AM/FM/ stereo radio with auxiliary inputs, tilting steering column, pre-trip lamp inspection, body builder's wiring to rear of frame, including sealed connectors, and tinted safety glass all around. It shall include a backup camera system with extra front mounted camera and 7" color in-cab monitor.

Instrument panel(s):

Instrument panel shall include; complete gauge cluster with speedometer, odometer, tachometer, engine coolant temperature, primary and secondary air pressure, fuel and DEF gauge, oil pressure gauge, transmission oil temperature gauge, and a display for on board diagnostics display of fault codes.

Electrical:

12 V Electrical System, with **either** three (3) H.D. batteries 1980 total CCA **OR** two (2) H.D. batteries 2000 CCA with battery cut-off switch. Positive and negative jump start posts, remote mounted.

The entire system shall be vapor sealed to eliminate moisture damage, "Nema-4" type or equal. IQAN Electronic Package includes; chassis tachometer, blower tachometer, operating mode, PTO mode, hydraulic oil temperature shutdown, hose reel speed, Water Pressure, and E-Stop shall be included. E-Stop activation must turn off rodder pump, shutdown Hydraulics, set chassis throttle to idle, stop vacuum. E-stop must be located at each operator interface; including hose reel controls, pendant control, wireless control (if equipped). Advanced diagnostics, updates, data retrieval, and remote diagnostics will be available. Reports, and hour meters will be accessible via the display.

Mirrors:

Mirrors shall be dual C-loop mirrors with minimum dual 7.5” convex spot mirrors.

Water Storage Tank(s)

Water tank shall have a 1000-gallon minimum usable capacity. Water storage saddle tanks shall be mounted no lower than chassis frame rails to keep the single piston pump inlet flooded. Water Tanks shall be made of a non-corrosive material with a lifetime warranty against corrosion. The bottom of the tank shall be protected by ¼" steel. The total tank capacity shall be divided into 250-gallon, separate, self-baffling cells that connect. Individual tanks shall all be mounted at the same level. Tank to pump suction shall have a 3” diameter shut-off valve with cast iron and a 3” diameter “Y” type strainer with a stainless-steel filter element. Baffled Tanks shall be connected with 4” diameter hose. Two (2) gravity drains shall be located below water tanks. One (1) 3” ball valve shall be located on the water tank crossover pipe at the rear of the unit. One “Y” strainer shall be located at the front of the water tanks. Water tanks are to raise with the debris body. One (1) ½” diameter ball valve shall be located on the water tank crossover pipe. There shall be a 5" air gap minimum on the fill tube. Clear sight level indicator tubes shall be mounted on both sides of unit. Tanks shall have a Ten-Year Warranty against defects in Materials and Workmanship.

OR

The water tanks shall be manufactured from a non-corrosive material. The water tank material shall require no internal coating and shall be repairable if patching is required. The water tanks shall be easily removed from the subframe to provide complete access to the truck chassis for maintenance purposes. The water tanks shall be adequately vented and connected. The water tanks shall be totally separate from the debris tanks and provide no structural support. The water tanks shall share no common walls with the debris tanks. The water tanks shall come equipped with an anti-siphon device and 25' of hydrant fill hose and fittings. The water tanks shall carry a 10-year warranty against corrosion or cracking. All water tanks shall be fully baffled to form a maximum compartment storage of 150 gallons for each compartment. The water tank shall be located for the lowest possible center of gravity while providing 100% gravity flooded intakes to water pump. Fresh water shall enter the tanks through an in line 6" air gap, all aluminum covered anti-siphon device. Water level sight tubes of non-yellowing plastic shall be installed on both tanks. The sides of these water tanks shall not extend more than 48" out from the centerline of the truck chassis. A fresh water drain system shall be provided utilizing the 3" Y-strainer on the pump. A minimum 6" connection between tanks shall be provided. The water tanks shall not elevate with debris body during dump cycle. An air purge system utilizing the chassis air system shall be provided. The system shall utilize the truck chassis air compressor to fill a 13-gallon auxiliary air storage chamber with pressure gauge and pressure protection valves. The system shall be equipped with ball valve and all necessary high-pressure piping hoses, couplings and controls. A 3 in-line "Y" trap strainer shall be located at inlet of water tank fill airgap. A 3 in-line "Y" trap Monel stainless-steel strainer shall be located between the water cells and water pump. A 3" gate valve shall be provided at water pump. Water tank must be a certified metered capacity of 1000 gallons. Water tanks shall be constructed of 1/8" aluminum with baffled compartments, maximum of 150 gallons each. A liquid float level indicator shall be provided.

Water Pump(s)

Water pump shall be a double acting, single piston hydraulic powered water pump with 1:1 oil to water ratio. It shall be driven by a flow & pressure compensating hydraulic system. It shall have a rated capacity of 100 GPM and 3,000 PSI continuous duty. The hydraulic pump and water pump shall be sized to produce 80 GPM @ 2500 PSI at an engine rpm of 1650 rpm or less. Manually operated dual hydro-pneumatic nitrogen charged 2½ pound accumulators with on/off valve shall be provided to handle pressures from 600 to 3000. The hydro-pneumatic accumulators shall be equipped with valves to allow operator to selectively activate jackhammer/blockage busting or the smooth continuous flow characteristic. A smart pressure sensing pump shall be included. The switch at the control panel shall control engagement and disengagement and variable flow zero to maximum GPM, from zero to full pressure. The pump shall be driven by two hydraulic pumps. One pump shall be powered by a transmission-mounted hot

shift PTO and the second pump shall be powered by the transfer case. The pump shall be mounted below the water tanks and forward of the debris tank. A single two-way ball valve shall be included for sewer nozzle operation. There shall be a multi flow system dial at the control panel to allow independent control of the vacuum pump and water pump. There shall be a single dial to control water pump on/off and water pressure. An in-line water to oil cooler shall be installed between the water tanks and the pump. A second air to water cooler shall also be installed. The water pump shall not require removal from the unit chassis for maintenance or repair. A minimum 40 GPM flow system shall be supplied. The unit shall include a self-contained system for purging water from jetting hose, handgun lines and pump. Air shall be supplied by unit chassis. A ½" valve shall be installed on the water pump. A five-gallon antifreeze tank shall be plumbed into the water pump.

OR

A high pressure rodder pump shall be hydraulically driven via two (2) variable displacement pumps utilizing two (2) 10-bolt PTO's. The high-pressure water pump shall be rated capable of continuous delivery of 100 GPM at 2500 PSI. High-pressure water pump system shall be completely controlled through the range with use of the MultiFlow Control and throttle located on the control panel. A digital flow meter shall be displayed in a front LCD display. The flow meter shall be capable of displaying system flow in all pump operating modes. In addition, a low water alarm shall be provided. Water pump speed to remain fully adjustable via an independent operator input regardless of the selected vacuum drive speed. Water pump shall include smooth and pulsation operation mode feature without altering pump flow. Water pump "pulsation mode" shall provide a forward-acting nozzle surge. Pulsation surge wave shall allow nozzle to punch forward 2" to 18" depending on flow dynamics and length of hose in sewer pipe. Water pump location shall provide a flooded gravity suction inlet. An oil to water heat exchanger shall be provided in the water system to cool all hydraulic fluids on the unit. The water pump shall provide precise 0-80 GPM controlled flow at variable pressure up to 2500 PSI. It shall include an extreme cold weather recirculation system - minimum 25 GPM via transmission PTO at chassis engine idle speed. A hydro-pneumatic nitrogen charged accumulator system shall be provided with all control valves, piping and hoses for either continuous flow or jackhammer rodding. Accumulator shall be a 2.5-gallon capacity and 1000 to 2500 PSI pressure rating. Two (2) 1/2" high pressure ball valves shall be provided. A nozzle rack accommodating three (3) nozzles shall be provided in curbside toolbox. The nozzles shall be labeled on storage rack for pipe size/flow and application. A handgun shall be supplied that allows for changing of flow pattern from a fine mist to a steady stream. The handgun shall come equipped with quick connect couplers. An additional 1" water relief valve shall be provided. A mid-ship quick disconnect handgun coupler shall be provided. A water pump hour meter shall also be provided.

Vacuum System

Vacuum pump shall have rotary lobe positive displacement "roots type" using two impellers rotating in opposite directions. The pump shall be rated for continuous duty. During normal vacuuming operation the chassis RPM should not exceed 1700 RPM. The unit shall be equipped with a high efficiency exhaust silencer. The vacuum pump shall be direct shaft driven from the transfer case. The power shall be supplied from chassis engine via the transfer case. A hot shift control shall be supplied at front control panel to engage and disengage vacuum pump. Three automatic opening vacuum relief valves shall be provided for vacuum pumps rated less than full vacuum. One (1) 14" diameter, internal stainless-steel float ball shall be supplied for automatic vacuum system shut off when unit is full. A minimum 113 square inches must be provided at the air exit duct. An externally mounted, vertical cyclone separator with a 16” diameter cleanout door shall be located between the positive displacement vacuum pump and the debris tank. The cleanout door shall be mounted less than four feet from ground level. The cyclone shall have a minimum 41,000 cubic inch internal operating size. A vacuum relief vent switch shall be located at operator’s station. The switch shall open a vent door via an air cylinder to relieve the vacuum without disengaging the vacuum pump. A single washable cartridge filter capable of containing particles sized 10 microns or larger shall be included. The cartridge filter housing shall be constructed of ¼” steel 28” in diameter and 22” in depth. The washable filter element shall be 22” x 21” and constructed of washable rigid polyester, in a stainless-steel housing that is 98% efficient @ 10 microns. The filter element shall have a total filter area of 120 sq. ft. A hydraulically operated vacuum boost valve shall be supplied. The valve shall close off the air flow through the boom. The vacuum pump shall produce a minimum of 4500CFM and 18” Hg. The vacuum Pump shall be Howden (roots) Model 824 RCS if available.

OR

Vacuum shall be provided by a positive displacement rotary lobe type blower driven via chassis engine and heavy-duty split transfer case direct to the blower. An interlock safety system shall prevent drive axle from engaging. A horizontal silencer with rain cap shall exhaust above the cab. A blower tachometer / hour meter shall be provided and displayed digitally on front control screen. Full vacuum and/or combination operation shall be approximately 1750 RPM of chassis drive engine. Blower shall be driven by the chassis engine and shall produce inlet volume of 4500 cfm @ 0" hg @ 2250 rpm, and 3650 cfm @ 16" hg @ 2250 rpm vacuum (Roots 824RCS 16 or equal). For added protection, the vacuum system shall have three (3) relief valves set at 16" hg, heavy-duty horizontal mounted noise muffler, removable and cleanable stainless-steel filter screen, and shall be enclosed with a steel cage guard for safety. The transfer case shall be activated by air via a one touch control located in cab with animated confirmation on screen. A hot shift blower drive system shall be provided, including transfer case, air shift

control, vacuum relief, and front control for blower engagement. The blower shall be driven from chassis engine via the transmission drive shafts and heavy-duty split shaft transfer case direct to blower, engagement via one touch control on front control panel. The blower drive mechanism shall be engaged and disengaged via an electrical switch located at the operator's station on the front mounted hose reel. The blower shall be provided with a horizontal silencer with exhaust above the cab and rain cap protecting the silencer from rainwater. A lever type drain valve shall be provided on right side. Blower shall draw air from two (2) separate ports in the debris body. Hydraulic shut off valves shall be provided at the suction, return and filter lines to permit servicing of the hydraulic system.

Debris Body

The debris body volumetric capacity shall be a minimum of 9.0 cubic yards and designed to withstand 360" of water vacuum. The debris tank shall be constructed of abrasion and corrosion resistant ¼" X-Ten steel, with a yield strength of 50,000 PSI and tensile strength of 70,000 PSI. The body shall have a hydraulic powered open and close, full height and width flat rear door with a self-compensating, double lipped neoprene seal located on door. Rear door shall be opened and closed by two power up/down hydraulic cylinders. The door shall hydraulically open 90 degrees. Four mechanical, wedge pin and receiver, hydraulically operated tailgate latches shall be supplied to secure rear debris tank door. Hydraulic latching shall be accomplished by a single hydraulic cylinder with mechanical linkage, separate from the door open close cylinders. There shall be an exterior liquid level gauge with a stainless-steel float and rod. Accu-level electronic debris tank level sensor shall be included. The system shall include an internal tank manifold flushing system with eight jets capable of full working GPM and PSI from the water pump. The debris inlet pipe shall be bolted to the debris tank and not require welding to replace. The make/break connection between debris inlet pipe and boom must compensate for uneven road and ground conditions by way of spring-loaded and gasketed mating plates. The body shall be raised with a two-stage double acting telescopic cylinder to enable the debris body to be powered up or down. The cylinder shall be trunnion mounted with greaseable pins. The debris body is to have a minimum dump angle of 50º. Rear body pivot pins shall be greaseable. Controls for latching/unlatching, opening/closing, and raising/lowering the debris body shall be located on the passenger side and forward of the debris tank. The rear gravity drain valve shall have a minimum 6" diameter opening and shall include a knife valve and 10' of fabric drain hose. A combined visual and audible alarm shall provide an alert whenever debris body or tailgate is being raised or lowered. Boom bearing and motor grease to be delivered by way of fittings located on the passenger side of the body. Fittings shall be no higher than 42" above the ground. Tailgate grease shall be delivered by way of a single fitting and grease manifold. The single fitting shall be located on the tailgate and no higher than 72" off the ground. The debris tank shall have a rear splash shield installed from the 3 to 9 o'clock position.

A vertical standpipe shall be inside the tailgate and be 18” in height with a bar screen. A 6” diameter rear-mounted body drain shall be included. A bronze gate valve with a locking handle and 10’ of lay flat drain hose shall be included. A minimum 40 GPM flow system shall be supplied.

OR

The debris body shall be cylindrical having a minimum usable capacity of 10 cubic yards. The body shall be capable of a 48" dump height. The debris storage body shall be constructed with a minimum 3/16" corrosion and abrasion resistant Ex-Ten steel. The debris storage body shall have a minimum yield point of 50,000 PSI and a minimum tensile strength of 70,000 PSI. The body shall have a rear door that is hinged at the top and is equipped with a replaceable neoprene type seal. It shall be adjustable for periodic compensation of door seal wear. Dual outward mounted rear door props shall be included. The vacuum shall be drawn from separate ports in the top of the debris body. Body shall be dumped by raising the body to a 50-degree angle utilizing a forward mounted, double acting hydraulic dump cylinder. Dumping must be accomplished while the pivot point of the body remains fixed to the subframe. An industrial style rear debris body door shall be flat and shall open and close hydraulically by cylinders mounted at the top of the body. Door shall open 50 degrees from the fully closed position. Door shall be unlocked, opened, closed, and locked by a failsafe hydraulically activated sequential positive locking system, cam operated by a single hydraulic cylinder, with all controls located behind truck cab, forward of the debris body. Debris body shall have a body flush out system with a fan-type spray nozzle located in the front wall of the debris body. The nozzle shall also utilize (2) spray nozzles. System must produce a flow of 80GPM. Control valve shall be on the curb side of the unit. Body shall have a float type automatic shut-off system protecting the fan system with two (2) 10" stainless-steel shut-off balls located in the debris body. Each float ball housing shall be within a non-corrosive slide-out screen assembly and be accessed without the use of tools. The debris body shall be equipped with a rear door drain and shall include a manually operated 6" butterfly valve with 10' of lay flat hose. Four (4) dual vertical (cyclone) centrifugal separators shall be installed in-line between the debris body and the air mover, two (2) per side for each debris body discharge port. Each dual separator shall include a large fallout chamber cleanout door.

A splash shield shall be mounted around the lower 60% of door openings to direct liquid and debris away from the chassis. Shield shall be minimum 10" deep bolted assembly with no openings. A lubrication manifold system shall be provided to allow ground level greasing of boom lift and swing cylinders, float level indicator, top rear door hinges and debris body hoist cylinder pins. A 10" valve with a 2" vent to atmosphere, electrically activated, air operated valve

debris body vacuum relief system shall be in the inlet of the vacuum. A debris inlet deflector shall be included.

Hose Reel

The hose reel assembly shall be front mounted with 270º manual rotation. Manual rotation shall occur between the headlights of the truck chassis. Hose reel assembly shall rotate on a large diameter ball bearing and include a pneumatically actuated lock, to positively lock the reel in any position across its operating range. The hose reel shall be capable of extending 18”. The hose reel shall have a 270º rotation while extended & a 180º rotation while retracted. The hose reel shall have a minimum capacity of 1000' of 1" I.D. sewer hose. Drum and flanges shall be constructed of ¼” steel. The drum shall have a minimum of 24" diameter. The reel shall be supported by two heavy duty self-aligning pillow block bearings and bolted to a ¼" thick support frame. 600 feet of 1" diameter plastic sewer cleaner hose, with 2500 PSI working, 6250 PSI burst pressure ratings minimum shall be included. Hose must be constructed per standards established by National Soiled Waste Management Association (NSWMA). Reel shall be driven by a double chain hydraulic drive that produces a minimum 14,600 in/lbs. torque and a variable speed from 0 to 40 RPM. Sewer hose footage counter shall be electronic with digital readout and 20 footage memory storage locations. Electronic calculation must automatically account for hose being paid out of the hose reel, not just measure reel rotations. A manually controlled level wind that utilizes four rollers shall be provided. The rollers must be designed to pivot over center. Rollers shall provide minimum bend radius of sewer hose for safer operation. A safety containment system enclosing the top half of the hose reel shall be provided, consisting of a guard constructed entirely of Lexan. A hot shift control shall be supplied at the front control panel to engage and disengage vacuum pump.

OR

The hose reel assembly shall be direct frame mounted. The hose reel assembly shall be mounted on an independent frame that can be removed from brackets that are attached permanently to front of main truck frame members. Reel shall be manufactured out of 1/4" spun steel and shall require no internal or external reinforcements. Hose reel shall be driven by an adjustable gear reduction chain and sprocket assembly. Hose reel shall operate at full rotational speed while chassis engine is at idle. A Hydraulic Telescoping Rotating Hose Reel - 800' capacity of 1" hose shall be provided. The front mounted hose reel shall telescope 15" forward down the centerline of truck. The entire reel assembly shall rotate 270 degrees on a large diameter ball bearing. The hose reel shall include a dual locking device to positively lock reel in any position across operating range. The hose reel shall rotate about the reel assembly centerline. A 400' x 1" sewer hose / 2500 PSI shall be provided. A hose footage counter shall be

supplied. A digital footage counter displaying footage values shall be provided. The system must be capable of resetting value to ensure operator safety. Accuracy to within one percent of actual distance, large easy to read LCD screen shall be located on the front control panel screen. A 10' leader hose will also be provided.

Boom(s)

The boom hose or tube end must be removable from the boom elbow. The power boom shall have a minimum of 217º hydraulic worm gear rotation and be lockable in any position. A boom rest shall be mounted to the sub frame. The boom shall not raise with the debris body. The boom shall have an articulated function that provides a vertical range of motion of no less than 16’ (40º) upward and 4’ (9º) downward from its horizontal position. The boom shall be equipped with a heavy-duty channel reinforced elbow. The lift capacity at the boom end shall be 1,000 pounds minimum, when boom is retracted. A joystick shall be permanently mounted to the operator control station for boom functions: up, down, left and right, and in/out. The boom shall be controlled by two options: (1) Joystick at front control panel, (2): remote controlled wireless pendant that recharges inside chassis cab. The boom vacuum pipe shall be 8" and reach a minimum of 26’ from centerline of unit. The hydraulic boom extension of 8' shall be a true telescoping tube inside of tube design which will extend and retract without affecting the vertical position of the boom. The boom support tubes shall be equipped with ultra-high molecular weight poly slides. The travel storage position shall be at the front right corner of truck bumper. The boom hose shall be removable from the steel elbow without tools or ladders. A boom up message and alarm shall be provided in the chassis cab. A centralized lubrication point for the boom shall be located on curbside of the unit accessible from ground level.

OR

Vacuum hose shall be designed for front operation. Hose shall be mounted and stored at a front mounted workstation. All connections between the debris body and vacuum system shall be of the self-adjusting pressure fitting type. The vacuum hose shall remain stationary and not rise with debris body. The upper debris tube shall consist of an anchored steel tube and elbow. A sub-frame mounted cab guard shall be mounted behind the cab with a boom rest cradle. All vacuum pipes shall be connected to the vacuum pick up tube and extension pipes by adjustable over-center quick clamps to join the aluminum flanges on pipes. One (1) quick clamp for each pipe supplied shall be provided. The boom pedestal shall be directly mounted to module subframe. Boom support used for travel mode shall not interfere with access or require removal to tilt hood forward. A control station shall be equipped with a control joystick for all directions as well as a safety emergency shut-down button, which shall automatically eliminate

power to boom. The vacuum boom shall have a heavy-duty flexible hose assembly joining the transition pipe to the debris body, and a 70-degree elbow and 5-1/2 heavy duty hose at the suction end of the boom. Boom shall rotate 180 degrees and shall be operated by an electric over hydraulic system. Lift and swing movements shall be actuated by hydraulic cylinders. The horizontal inner steel vacuum tube and inner box beam boom section shall telescope (tube within tube, box beam within box beam) and retract a minimum of 10' without affecting the vertical position of the pick-up tubes, and shall be located at the front work station in its retracted position, providing 324" maximum reach off the longitudinal axis of unit. The boom shall be fully controlled by a remote push button pendant control station with a 25 ft. cable. Controls to include up / down, left / right, in / out boom functions, vacuum relief, e-stop and main power switch. A joystick for hydraulic control of the boom shall be installed on hose reel front panel. A grate lifting hook shall be installed on the boom. A water ring assembly shall be installed in the vacuum suction hose at the debris body inlet. A removeable 4" diameter storage "post" shall be included. Storage device shall not interfere with raising hood.

Controls

IN-CAB CONTROLS

The in-cab control center shall include a means of selecting Road Mode or Work Mode. The in-cab control center must have a digital display including:

- Body Raised message and alarm
- Boom Raised message and alarm
- Tailgate unlocked message and alarm
- E-stop active alarm
- Control system status menus which indicate working or fault conditions
- Strobe and LED work lights & safety light controls

OR

All in-cab controls shall be located on a single in-cab control screen. This shall be a full color display screen. It shall utilize 12 back lit tactile (glove ready) buttons on the sides of the screen as well as feature touch screen operation. Screen shall control the following:

- Back up camera features
- Work lights
- Standard arrow boards or arrow stick
- Safety strobes and beacons
- Jet or Combo mode Control screen must display an o
- Representation of the chassis drive system must animate to show as drive systems activate or deactivate.

- Recirculation must be activated on the in-cab control screen and visibly show when it is active at all times.

FRONT CONTROLS

The operator front control center shall be located at the front of the unit. The front control center shall include a means of selecting vacuum mode (disabling the body movement functions) or Dump Mode (disabling the boom movement functions). The front control center shall include a digital display including:

- Engine speed
- Water pressure
- Hose reel payout
- Hose reel speed in feet per minute
- Sewer hose footage counter with 20 bank memory
- Plug in Pendant
- Debris tank level
- Fuel consumption
- Fuel level
- Water Flow Rate
- Fresh Water Level
- Water Pump Hour Meter
- Vacuum level (inches Hg)
- Blower engagement
- Blower speed
- Blower hour meter
- Blower temperature
- Engine oil pressure
- Engine temperature
- Engine voltage
- Chassis air pressure
- Unit hydraulic temperature
- Control system status menus which indicate working or fault conditions for trouble shooting
- Backup controls menu with a secondary means of engaging the blower, water pump and moving body and boom functions
- Screen that provides a rolling hour countdown of key maintenance requirements
- Valve settings menu to adjust maximum and minimum speeds of the boom movements and the hose reel pay-in/pay-out speed.
- Single two-way ball valve for jetter hose on/off.
- Hose reel joystick control pay in/pay out with speed control.
- Boom joystick control
- Emergency stop red knob
- Vacuum relief control switch
- Vacuum Boost valve control switch
- Reel pivot brake control button
- Water pump variable flow control
- Hot shift vacuum/engine speed control dial with safety speed sensor
- A single button on the control panel to engage and disengage vacuum pump

In the event of failure by the chassis to provide power to the hydraulics, a 12-volt power-pack will provide emergency hydraulics to the body, boom and hose reel. All standard body, boom and hose reel control inputs will function when under the backup hydraulics. Operation of this feature does not require the engine to be running.

A wireless remote control shall also be provided in addition to the wired pendant control. The control shall be contained in a waterproof/shock proof housing with a carrying case with belt and shoulder strap. The wireless remote control shall have the following functions:

- Boom up/down, in /out, left/right
- Engine throttle

- Water flow and pressure
- Vacuum relief vent door
- Emergency button
- A reset function
- Control the sewer hose pay out/retrieve function of the hose reel.

- Rear Door Unlock, Raise, Dump / Eject, Lower and Lock

- 2x16 character backlit LCD panel display.
- Water pressure in PSI.
- Payout footage in feet.
- Reel Speed in percentage
- Fresh water level in percentage
- Debris level in percentage
- Engine RPM
- Operating System Status.

OR

Primary operator station will be located at front of truck on right curb side of hose reel. All operator controls should be located on a single control panel that can be rotated on a 90-degree arc. The control panel shall also feature the ability to raise and lower. Station shall include back lit button keypads with, laser etched function icons, and 4 light feedback indicators. Station shall include a touch enabled display screen to display/control the following:

- hose footage
- hose reel speed settings
- water pressure
- water flow
- air mover information
- chassis data
- mode indicator
- chassis fuel level
- water level indicator
- vacuum debris body level
- diagnostic controls
- remote/panel selector
- work lights
- hose reel extend/retract
- hose reel lock
- pinch roller activation
- vacuum functions.

Additionally, there will be separate sealed rocker switches for water pump on/off and throttle up/down. There shall be a multi flow control dial for controlling the full range of the water pump. There shall be a hose reel joystick to control the pay in and pay out of the hose reel, this joystick shall offer speed control that increases the further the joystick is moved in either direction. There shall be an additional hose reel speed dial for setting specific speed ranges of the reel. There shall be a boom joystick that controls all function of the boom including up/down, left/right, and extend/retract. There shall be an E-Stop button for machine. Tachometer and hour meter for chassis engine shall be located on the control station. Tachometer and hour meter for centrifugal compressor shall be located on the control station. All hydraulic functions -color coded, sealed electric/hydraulic NEMA 4 switches shall be provided. Fan engagement/vacuum relief - sealed electric/air NEMA 4 switch shall be provided. A water pump hour meter shall be provided. A PTO hour meter shall be provided.

CURBSIDE CONTROL CENTER

The curbside control center shall include a means of selecting vacuum mode (disabling the body movement functions) or dump mode (disabling the boom movement functions).
The Curbside control center shall include:

- Pendant Plug
- Panel Lights
- Emergency E-Stop red knob
- Push-button controls to open and close the tailgate
- Push-button controls to raise and lower the debris body
- Push-button controls to eject and retract the Ejector plate.
- Push-button controls to increase and decrease water pressure.
- Ejector Plate hydraulic pressure gauge

OR

The curbside control center shall be located at a central curb side location directly behind the cab of the truck and include dump controls, accessory controls and e-stop controls. Door shall be unlocked, opened, closed, and locked by a failsafe hydraulically activated sequential positive locking system, cam operated by a single hydraulic cylinder, with all controls located behind truck cab, forward of the debris body.

Lighting

Two (2) LED floodlights shall be mounted on opposite sides of the boom elbow. Two (2) LED North American Signal Part# LED400HD-A strobe lights or equal shall be mounted top rear of body, two (2) LED strobe lights shall be mounted at front section of boom and one (1) LED top rear traffic advisor and have in cab controls. Two (2) LED strobe lights shall be mounted on lower front of unit, two (2) LED strobe lights shall be mounted lower mid-length of unit two (2) LED strobe lights mounted on lower rear of unit and have in cab controls. Two (2) LED flood work lights shall be mounted on the tailgate and two (2) shall be mounted on the power unit. All lights are to be shock mounted or shock resistant to eliminate failure.

OR

One (1) one-piece directional 10-light arrow board (Signal Master or equal) shall be mounted on rear door of the debris body, with controls mounted in cab. One (1) strobe LED amber beacon-rear door-facing rear shall be provided. One (1) strobe LED amber beacon- front Cab Guard mounted shall be provided. Operator station shall have back lit buttons for low light operation. Two (2) LED boom work lights shall be provided.

Vacuum Tubes & Brackets

8” O.D. aluminum tubes with male/female fittings shall be supplied. One (1) 5’ catch basin section, two (2) 7’ section, two (2) 5’ sections, and one (1) 3’ section shall be supplied. Eight (8) gasket and over center clamps shall be provided. A 4-tube storage rack with polymer tube holders shall be located on the rear door. Two (2) 3-tube vertical storage racks shall be mounted to the exhaust silencer on the passenger side and be street level accessible.

OR

A minimum of five (5) vacuum tubes shall be stored on curbside storage racks. They shall include quick release retainer handles (no bungees or clamps). A curbside, folding 3-pipe rack shall be provided, constructed of steel tubing and be spring assisted. It shall include quick release retainer handles (no bungees or clamps). A fixed rear door mounted 2-pipe rack shall be provided. It shall include quick release retainer handles (no bungees or clamps). Two (2) Pipe Storage Racks shall be included on the rear door with quick releases.
The basic vacuum tube package shall include the following: One (1) 8" x 3' aluminum pipe, two (2) 8" x 5' aluminum pipe, one (1) 8" x 6'6" catch basin tube, four (4) 8" quick clamps and one (1) Water Ring Assembly mounted between the boom and body inlet.

Toolboxes

Two (2) lockable diamond plate aluminum toolboxes, 18"x18"x48", shall be frame mounted on the passenger side mid–ship. One (1) lockable diamond plate aluminum toolbox, 22” X 14” X 60”, shall be frame mounted on the driver’s side mid–ship.

OR

One (1) Aluminum toolbox with nozzle storage and dump controls mounted curbside shall be provided. One (1) Aluminum toolbox shall be located behind the cab. A safety cone storage rack shall also be provided to contain safety cones in the upright position.

Washdown System

The main water pump shall supply a water source with means of regulating pressure from 0 to 2500 PSI available at handgun quick disconnect. A retractable hose reel with live center complete with 50' x ½" hose shall be provided with a quick disconnect located behind the cab. A 2500 PSI wash down gun with adjustable nozzle shall also be provided.

OR

A handgun with 1/2" x 35' hose shall be provided at mid-ship to allow the operator to deliver water to area served by pick up hose and to the inside of the debris body for clean out. A hand sprayer with an adjustable spray-pattern shall be provided with trigger-style gun.

Additional Parts & Accessories

HYDRO-EXCAVATION ACCESSORY KIT

Hydro-Excavation package shall be included that contains; one (1) 8” x 6” reducer, one (1) 6” x 6’ dig tube with non-conducting cuff, one (1) 3000 PSI rated handgun with on/off trigger, one (1) ½” x 30” pipe extension with quick disconnects, three (3) ½” x 6’ Pipe extensions with quick disconnects, one (1) 12 GPM Ripsaw nozzle, one (1) each of 8” diameter and 6” diameter super tube locking clamps, one (1) each of an 8” diameter and 6” diameter “O” Ring, one (1) additional fan cooling. One (1) 1" large chisel nozzle with hardened orifice and one (1) 1" 3D extreme nozzle with hardened orifice shall also be included.

OR

Hydro-Excavation Package shall be included that contains; lances, nozzles, storage tray, and vacuum tubes. The water system shall allow a precise variable flow control range of 0-22 GPM at 2500 PSI with a digital flow meter in clear view of adjustment control. Sewer tool & accessory kit includes; one (1) 30 sand nozzle, one (1) 30 deg. sanitary nozzle, one (1) 15 deg. penetrator nozzle and one (1) 1" small finned nozzle pipe skid. One (1) 8" x 3'-0" Higbee C/B Nozzle Assembly and one (1) Culver Nozzle - 80 GPM shall also be included.

Paint

Paint to be manufactures standard “white”.

SPECIAL INSTRUCTIONS

The successful bidder shall be required to compile all manuals, operation guides, warranty information, etc. on the special equipment in ring binders and an electronic copy. The binders shall be compiled according to serial numbers of equipment mounted in each truck. The successful bidder shall provide training lights, PA system, message board operation, air

compressor, and jump start system. Training shall be a minimum one-day class of operation, maintenance and troubleshooting for each component at each FOB destination.

PARTS AND SERVICE

Manufacturer's franchised authorized dealer must have parts and service facility within four (4) hours of FOB delivery location to be considered for an award. This must be a full-service franchised dealership which includes:

- Sales Management
- Field Representatives
- Manufacturer's required specialized tools
- Fully equipped service trucks
- Factory trained technicians

Warranty

Warranty shall be standard manufacturer's warranty unless stated otherwise above.